

Product Analysis Certificate

Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (Packaged)



Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (55K)

Shipment Contents: Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (Packaged)
— Store at -80°C

Description:

Cellecta's shRNA libraries are pooled barcoded lentiviral shRNA libraries constructed in third-generation lentiviral vectors and optimized for RNAi genetic screens in pooled format. The use of our proprietary shRNA design algorithm and database of validated shRNAs results in a high percentage of functional sequences, typically at least 70% knockdown efficiency for more than 95% of the target genes represented and 65% of the shRNAs (depending on the cell type). The vast majority of shRNA constructs in the library are represented equally, with the difference in concentrations usually not exceeding two orders of magnitude. Typically, virtually 100% of the population of shRNA constructs is present within a 10 to 100-fold range. We guarantee that at least 90% are present within a 100-fold range and 70% are present within a 10-fold range.

Specially-designed, optimized barcodes facilitate HT sequencing data analysis and identification of functional shRNAs. Using the Illumina GAIIx, HiSeq, or NextSeq HT Sequencing platform, barcodes are identified and converted to lists of genes/shRNA with enumerated barcode data. Amplification of shRNA hairpins is not required, as only the barcode sequence is required for identification. This enables unbiased amplification and unambiguous identification of each shRNA species.

The Human Genome-Wide shRNA library consists of 3 modules and targets all protein-encoding genes:

- Each module covers approximately 6,500 genes
- Each gene is targeted by 7-8 hairpins for a total of 55,000 hairpins per module
- Modules are made with non-overlapping barcodes so that they can be combined to form a complete genome-wide shRNA library
- Library targets all (19,276) protein encoding genes

Human Module 2 targets disease-associated genes and known drug targets.

The libraries are constructed in Cellecta's pRSI16cb-U6-sh-13kCB18-HTS6-UbiC-TagRFP-2A-Puro lentiviral vector which expresses shRNA under a wild-type U6 promoter and TagRFP (Evrogen) and Puro resistance gene under a human ubiquitin C promoter. For more information on the 13k Clonal Barcodes (13kCB18), please contact Cellecta at tech@cellecta.com.

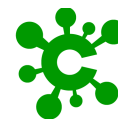
The titer of packaged libraries provided by Cellecta is functionally determined by transduction of 293T cells at low MOI and FACS of RFP-positive cells.

Biosafety Level: BSL-2

Storage: -80°C

Shelf Life: 1 year from date of receipt

Shipping Conditions: Dry Ice



CELLECTA

Product Analysis Certificate

Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (Packaged)

Product Information (Collecta Website):

User Manual: <http://www.collecta.com/resources/product-manuals-and-certificates/>
 Target Gene List: [http://www.collecta.com/products-services/...](http://www.collecta.com/products-services/)
 Vector Info (Sequence, cassette, etc): <http://www.collecta.com/resources/vector-information/>
 shRNA sequences/barcodes: Please contact Collecta at orders@collecta.com.

Contents:

Catalog #	Description
HGW-M2-V8	<p>Human Genome-Wide Module 2 Pooled Lentiviral shRNA Library (55K) hGWM2-pRSI16cb in pRSI16cb-U6-sh-13kCB18-HTS6-UbiC-TagRFP-2A-Puro Packaged, >2 x 10⁸ TU: 2.44 x 10⁸ TU, 1.19 x 10⁹ TU/ml (205 µl total: 50 µl x 4 vials, 5 µl x 1 vial) Lot# 18011146; Store at -80°C <i>NOTE: Exact number of tubes and volume may vary. Total TU is always >2 x 10⁸.</i></p>

Quality Control

Library Representation

Please see attached Excel file, **hGWM2-pRSI16cb-shRNA-Lib-HTSeq-QC-130723.xlsx**.

Individual Clone Sequencing Data

The sequencing data shown is that of the Human Genome-Wide Library (hGW) which is comprised of equal amounts of hGWM1, hGWM2, and hGWM3.

	Library:	hGW in pRSI16cb
Plasmid Lot #:		12121403
Library Complexity (number of clones):		100 x 10 ⁶
Number of random clones picked:		72
Correct Structure (with clonal barcode):		>95%
Number of clones with at least one mutation, deletion, or insertion:		12
Mutation / Deletion / Insertion Rate:		0.1%
Estimated % of Inserts without any mutations, deletions, or insertions in <u>antisense</u> portion and considered to be functional:		>95%

Collecta now offers sample prep, HT sequencing, and data analysis services. Please contact us at sales@collecta.com or visit our website at <http://www.collecta.com/products-and-services/HT-sequencing-and-analysis/> for more information.

Product Analysis Certificate

Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (Packaged)



Terms and Conditions

Cellecta, Inc. Limited License

Cellecta grants the end user (the "Recipient") of the Human Genome Wide Module 2 shRNA Library (the "Product") a non-transferable, non-exclusive license to use the reagents for internal research use only as described in the enclosed protocols; in particular, research use only excludes and without limitation, resale, repackaging, or use for the making or selling of any commercial product or service without the written approval of Cellecta, Inc. -- separate licenses are available for non-research use or applications. The Product is not to be used for human diagnostics or included/used in any drug intended for human use. Care and attention should be exercised in handling the Product by following appropriate research laboratory practices.

Cellecta's liability is expressly limited to replacement of Product or a refund limited to the actual purchase price. Cellecta's liability does not extend to any damages arising from use or improper use of the Product, or losses associated with the use of additional materials or reagents. This limited warranty is the sole and exclusive warranty. Cellecta does not provide any other warranties of any kind, expressed or implied, including the merchantability or fitness of the Product for a particular purpose. Use of the Product for any use other than described expressly herein may be covered by patents or subject to rights other than those mentioned. Cellecta disclaims any and all responsibility for injury or damage that may be caused by the failure of the Recipient or any other person to use the Product in accordance with the terms and conditions outlined herein.

The Recipient may refuse these licenses by returning the enclosed Product unused. By keeping or using the enclosed Product, you agree to be bound by the terms of these licenses. The laws of the State of California shall govern the interpretation and enforcement of the terms of these Licenses.

Limited Use Licenses

The Recipient acknowledges that Product has been developed by Cellecta based on licenses from Third Parties and agrees with the Terms of Limited Use for the Recipient provided by the Third Parties:

Agilent Technologies, Inc. End-User Label License for the use of shRNA libraries comprising Oligo Pools:

"This Internal Use only license grants End-Users the sole right to use and fully consume or destroy this product (the "**Product**"). Use of the Product is limited to Research Use ONLY, not for diagnostic procedures. In all cases, sale or other transfer or distribution to third parties of (i) the Product, or any portion, (ii) DNA, RNA and protein constructs or libraries created from the Product or any

Life Technologies Corporation End-User Label License for the use of Lentiviral Expression System:

"This product or service (based upon the Lentiviral Expression System) is sublicensed from Life Technologies Corporation under U.S. Patent Nos. 5,686,279; 5,834,256; 5,858,740; 5,994,136; 6,013,516; 6,051,427; 6,165,782; 6,218,187; 6,428,953; 6,924,144; 7,083,981 and 7,250,299 and corresponding patents and applications in other countries for internal research purposes only. Use of this technology for gene therapy applications or bioprocessing other than for nonhuman research use requires a license from GBP IP, LLC. Please contact GBP IP, LLC 537 Steamboat Road, Suite 200, Greenwich, CT 06830. Use of this technology to make or sell products or offer services for consideration in the research market requires a license from Life Technologies Corporation, 5791 Van Allen Way, Carlsbad, CA 92008."

Evrogen IP JSC End-User Label License for the use of lentiviral shRNA constructs comprising TagRFP-encoded gene:

"This product is for internal non-commercial research use only. No rights are conveyed to modify or clone the gene encoding fluorescent protein contained in this product. The right to use this product specifically excludes the right to validate or screen compounds. For information on commercial licensing, contact Evrogen Licensing Department, email: license@evrogen.com".

Cold Spring Harbor Laboratory (CSHL) shRNA Product End-User Label License for use of expression vectors encoding an shRNA

Acceptance. This Limited Use License ("License") contains the exclusive terms and conditions between CSHL and Customer for use of the Product. By opening the Product container or in any other way accessing or using the Product ("Acceptance"), you will create a binding legal contract upon the terms and conditions herein, without modification. Customer's purchase order or similar terms shall not apply to this License. If you are not authorized by Customer to enter into this License or do not agree to all terms and conditions in this License, then you are prohibited from opening the Product container or otherwise accessing or using the Product.

Permitted Use. Portions of the Product are covered by US and foreign patent applications or patents and other proprietary intellectual property rights owned by CSHL ("shRNA IP Rights"). Subject to Acceptance and all terms and conditions of this License, sale of the Product to Customer by Seller (acting under its license from CSHL, an "Authorized Sale") conveys to Customer only the nonexclusive, nontransferable right under the shRNA IP Rights to use the Product solely for Customer's internal research purposes, and only at its facility where the Products are delivered by Seller.

Unlicensed Products. Any Product that is acquired other than pursuant to an Authorized Sale (including without limitation, any Product not acquired from Seller) shall be deemed to be an "Unlicensed Product". This License shall be void and of no effect for Unlicensed Products and shall not convey any express or implied right to make, use or sell Unlicensed Products for any purpose.

Restrictions. Customer obtains no right to sublicense its rights, or to use the Product for the benefit of any third party for any commercial purpose (including without limitation, using the Product in connection with providing services to any third party or generating commercial databases). The Product may not be used in vitro or in vivo for any diagnostic, preventative, therapeutic or vaccine application, or used (directly or indirectly) in humans for any purpose. Customer may not isolate, extract, reverse engineer, derive, copy or separately use any component of the Product (such as, for example, any shRNA component) for any commercial purpose (including without limitation, for the purpose of making Products) other than solely for Customer's internal research purposes.

Non-Profit Customers. If Customer is a Non-Profit Entity, then the following additional restrictions shall apply: Customer obtains no right to use the Product for any commercial purpose.

Commercial Customers. If Customer is a Commercial Entity, (unless Customer has already entered into a separate written agreement that has been executed by CSHL, that covers the shRNA IP rights, and that is then currently in effect) then the following additional restrictions shall apply: This License and Customer's rights hereunder automatically terminate 1 year after delivery of Product to Customer. After 1 year of Product use customer



CELLECTA

Product Analysis Certificate

Human Genome-Wide Module 2 (hGWM2) Lentiviral shRNA Library (Packaged)

must enter into a separate written agreement with CSHL that covers the shRNA IP rights or Customer shall immediately stop using and destroy all Product in its possession. The Product may not be used to make any mouse that is of a strain of mice for germ line transmission by embryonic transfer of a gene encoding an shRNA that induces suppression of a gene or genes by RNAi.

No Transfers. Customer may not distribute or transfer the Product (by license, sale, loan, lease, rental or any other means) to any commercial partner or any other third party for any commercial purpose, except only in the following case. Customer may transfer the unmodified Product to a commercial third party contractor who, pursuant to a written agreement with Customer and only for non-royalty based payment(s), undertakes on behalf of Customer to use the Product solely for Customer's benefit and internal research purposes, which third party shall not, after termination of such work, retain or receive subsequent rights to possess, access or use any Product (or any results of such work), and from whom Customer receives no payments pursuant to such agreement.

Compliance. Customer may only use the Product in compliance with all local, state, federal and other applicable laws, regulations and rules, including without limitation (for uses in the United States), EPA, FDA, USDA and NIH guidelines, Customer may not (directly or indirectly) use the Product, or allow the transfer, transmission, export or re-export of all or any part of the Product or any product thereof, in violation of any export control law or regulation of the United States or any other relevant jurisdiction.

Disclaimers. THE PRODUCT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. NO WARRANTY IS MADE THAT THE PRODUCT WILL MEET CUSTOMER'S REQUIREMENTS, OR THAT ANY RESULT CAN BE ACHIEVED, OR THAT USE OF THE PRODUCT WILL NOT INFRINGE ANY PATENT OR OTHER PROPRIETARY RIGHT. ALL WARRANTIES, EXPRESS OR IMPLIED, ORAL OR WRITTEN, ARE HEREBY EXPRESSLY DISCLAIMED, INCLUDING WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF NON-INFRINGEMENT, QUIET ENJOYMENT, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE.

Other Uses. Except for the limited use expressly specified above, no other license is granted, no other use is permitted and CSHL retains all rights, title and interests in and to the shRNA IP Rights. Nothing herein confers to Customer (by implication, estoppel or otherwise) any right or license under any patent, patent application or other proprietary intellectual property right of CSHL other than the shRNA IP Rights. For information on purchasing a license to use the Product for longer time periods, in greater quantities or for other purposes, or to practice more broadly under the shRNA IP Rights, or to practice under other CSHL intellectual property rights, please contact the CSHL Office of Technology Transfer at (516) 367-8301.

Definitions. "Affiliate" means, at the time of reference thereto, any corporation, company, partnership, joint venture or other entity which controls, is controlled by or is under common control with the subject entity, where "control" means direct or indirect ownership of more than 50% of (i) the outstanding stock or other voting rights entitled to elect directors or (ii) all ownership interests (or, in any country where the local law shall not permit foreign equity participation of 50% or more, then the direct or indirect ownership or control of the maximum percentage of such outstanding stock, voting rights or ownership interests permitted by local law). "Commercial Entity" means any entity or organization other than a Non-Profit Entity. "CSHL" means Cold Spring Harbor Laboratory. "Customer" means the company or other entity or organization that orders, pays for and takes delivery of the Product. "Non-Profit Entity" means any college, university or governmental entity (including without limitation, governmental and quasi-governmental institutes and research laboratories), or any non-profit scientific, research or educational organization that is of the type described in section 501(c)(3) of the Internal Revenue Code or that is qualified under a state non-profit organization statute. "Product" means a product (including without limitation, expression vectors encoding an shRNA), the design, manufacture or use of which (in whole or in part) is the subject of the shRNA IP Rights, and is deemed to include all components, progeny, reproductions, modified versions and other derivatives thereof. "Seller" means Cellecta, Inc.

© 2015 Cellecta, Inc. All Rights Reserved.

Trademarks

CELLECTA is a registered trademark of Cellecta, Inc.